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ABSTRACT

A study investigated the effect of Frank O'Hare's "Sentencecraft" sentence combining program on the written syntactic skills, reading comprehension level, and speed of average ability ninth-grade students. The sample consisted of 75 experimental group students and 68 control group students. Following a pretest, the experimental group received 9 weeks of practice in combining kernel sentences into more complex and mature syntactic forms. For the remainder of the 16-week experimental period, both groups wrote six argumentative compositions at 2-week intervals, except for essay two, which was written 3 weeks after the pretest. The six compositions were scored by counting the total number of words, words per T-unit, words per clause, and clauses per T-unit. Reading comprehension level and rate were measured by the Davis Reading Test. A posttest was administered after 16 weeks, followed by a delayed posttest 8 weeks after that. No significant mean increases were found across the six writing occasions as a result of the "Sentencecraft" program. Differences in mean reading comprehension level scores of both groups were significant between pretest and delayed posttest, with no significant differences on testing occasions, suggesting that the experimental treatment was not effective in improving students' level of comprehension. Nor did the experimental group show a significant mean increase in "speed of comprehension" between pretest and delayed posttest. (HTH)

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The Effect of Sentence-Combining Practice on the
Development of Reading Comprehension and the
Written Syntactic Skills of Ninth Grade Students

Thomas B. MacNeill

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The Effect of Sentence-Combining Practice on the
Development of Reading Comprehension and the
Written Syntactic Skills of Ninth Grade Students

This research was designed to investigate the effect of the O'Hare Sentencecraft (1975) program on the written syntactic skill of average-ability, ninth-grade students, using written argumentative compositions as the data source. To clarify the impact of mode of written syntax, the syntactic frequencies achieved by students in this study were compared with those found by Hunt (1965) and Loban (1976). A second purpose was to determine the effect of the Sentencecraft program on the reading and comprehension "Level" and "Speed" skills of the same students as measured by the Davis Reading Test, Series 2 (Davis and Davis 1962).

A number of studies using sentence combining have shown that such programs can induce significant growth in syntactic maturity when words per T-unit, words per clause, and/or clauses per T-unit are used as the indicators (Gajadharsingh, 1970; O'Hare, 1971; Fisher, 1973; Combs, 1975; Pedersen, 1977; and Sullivan, 1979). The present study went one step further. It attempted to determine whether there was a significant increase in the frequency of appearance of the various structures practiced, based on data obtained from argumentative compositions. Only those structures reported by Hunt (1965, p. 147-8) as being most highly correlated with syntactic maturity in older writers were counted. These were: noun, adjective and adverb clauses; the percentage of short, medium and long T-units; the mean number of modal auxiliaries, perfect forms, and passives; the mean

number of prepositional phrases as noun modifiers; the mean number of infinitives, present participles and past participles as noun modifiers; the mean number of genitives; and the mean number of adjectives. The study tried to determine whether the significant decline in the major indices (W/TU, W/CL, and CL/TU) which Combs (1975) found after the delayed post-test would be evident in the results of this study as well. The individual grammatical structures were also used for this analysis.

The question of the relationship between written syntactic ability and reading comprehension has also been explored in a large number of studies (Gough, 1965; Savin and Perchonock, 1965; Slobin, 1966; Bormuth et.al., 1970; Fagan, 1971; Albanese, 1972; Rutland, 1975; Takahashi, 1975). Pavlak (1973) undertook a review of all "available, scientifically accurate studies conducted within the past twenty-four years" (p. 1). The strongest conclusion he could reach was this: "There is a relationship between children's knowledge of grammatical structure and their ability to comprehend in reading." (p. 180) The correlation between the two variables, however, was very low for each study he reviewed. Because of the relationship between reading and writing which such research findings suggest, and the inconclusive nature of the research using sentence combining to improve reading comprehension, (Fisher, 1973; Shockley, 1974; Hughes, 1975; Combs, 1975, Smart and Ollila, 1978) the present study sought to clarify the impact of Sentencecraft on the Reading Comprehension "Level" and "Speed" scores of a group of grade nine students as measured by the Davis Reading Test.

Perhaps the most important undertaking of the present study

was the frequency counts comparisons' made between the results of this study using argumentative writing samples and the same structure counts made by Hunt (1965) and Loban (1976) which involved a variety of modes. Of lesser import, perhaps, is the selection and administration of an appropriate "Speed of Comprehension" test to determine the effect of sentence-combining practice on this reading skill.

DESIGN

The study used a true experimental design which was derived from Campbell and Stanley's (1963) "Pretest-Post-test Control Group Design". (p. 13) A delayed post-test and more frequent repeated measures on the writing variables was added. "Level" and "Speed" of Comprehension were measured on Pretest, Post-test, and Delayed Post-test Occasions. Additionally, the major writing indices of number of words, T-units, and clauses written, as well as the number of words per T-unit, words per clause, and clauses per T-unit were measured on three additional occasions during the nine-week experimental treatment. The delayed post-tests were administered eight weeks after the post-test.

Sample

The experiment was carried out from mid-February to mid-June, 1978 and involved six of the eight grade nine classes in Spruce Grove Composite High School, Spruce Grove, Alberta. This school is the only high school in a town of 7,000 people, ten miles from the city of Edmonton, Alberta, Canada. According to the school administration, the school population (Grades 9-12) is drawn from a cross-section of the socio-economic spectrum ranging from professionals to laborers. Many

of the people commute to jobs in Edmonton. About seventy percent of the school population lives in the town and thirty percent are from the surrounding rural area. The school population was 740. The school was unsemestered. Each of the three teachers involved in the experiment taught one experimental and one control class. (The two classes not involved in the study were taught by different teachers and were used in piloting the Sentencecraft program and composition topics.) The six classes which took part in the study were divided into two classes each of high, middle, and low ability on the basis of their scores on a school-wide, staff-constructed, mid-term English exam. One teacher taught both classes at each level. Classes at each level were randomly assigned to be the experimental or control group.

Eleven students were lost due to experimental mortality. Six were from the low-ability groups. All were no longer accessible for inclusion in the experiment. Thus seventy-five experimental students and sixty-eight control students completed the tests to be used in the analyses.

Treatment

The treatment variable in the experiment was the sentence-combining program Sentencecraft by Frank O'Hare. This program, based on the exercises used in his original study, uses a workbook format which gives the student practice in combining kernel sentences into more complex and mature syntactic forms. Thus the experimental group received practice in manipulating a number of syntactic constituents as indicated by the following list: Free modifiers; adverb phrases;

noun clauses; It-inversion; subordinate clauses; Wh and Infinitives as object; Ing-nominalization; genitives; infinitive nominals; relativization; WH — Be deletion; clauses of time, cause, and concession; nominal expansions, and "open" sentence combining.

The nine-week treatment, as outlined in Sentencecraft was followed in this study. It was introduced as a program designed to help students write better.

To demonstrate that that this program could be an effective method of improving reading comprehension, Table 1 lists the structures identified by researchers as being most difficult to comprehend. The bottom of the table shows which structures were practiced in the treatment.

Writing assignments within the English classes during the seventeen weeks of the experiment were limited to approximately one loose-leaf page per week. The amount of writing outside of English class was uncontrolled. (It should not have been a major confounding variable, however, because the classes were not intact across other subject areas). The control group undertook the same amount of writing as the experimental group. During the time devoted to the treatment, the control group studied other writing-related areas such as spelling, punctuation, usage and parsing. They did not undertake any kind of sentence-combining activity nor was either group involved in any kind of reading program.

Instrumentation

Writing. The instrument for measuring written syntactic ability consisted of a single theme written on each testing occasion.

The validity of this method for obtaining measures of group achievement has been supported by Diederich (1946) and Kincaid (1953).

Topic, mode, and time have been controlled as was suggested by Braddock (1963, p. 17). He indicated that this control was especially imperative when conducting frequency counts. The present study has attempted to eliminate some of the shortcomings encountered in previous studies in this regard. One sixth of the students wrote on each topic on each occasion in order to control for its effect. Each student was randomly assigned to one of six different topic sequences. The topics were:

1. Education should be compulsory.
2. I wouldn't want to live in any other country.
3. The world won't survive past the year 2000.
4. Marijuana should be legalized.
5. Advertising is bad for people.
6. Everybody needs friends.

Researchers such as Perron (1976) and Crowhurst (1977) have shown that the argumentative mode elicits the most complex syntax from students, therefore, it was used as the best indicator of what students are syntactically capable in their writing. The time variable was controlled by allotting fifty-five minutes of class time for completion of each composition. This conforms to Braddock's suggestion (1963, p. 8) in which he suggests fifty minutes for junior high school students. The additional five minutes were allotted to allow time for student groups to discuss their topics for the day.

Reading. The main variables which had to be controlled to measure

gains in reading comprehension were semantics and syntax. In order to achieve this, one-third of the students wrote one form of the reading test on each occasion. Students were randomly assigned to one of three form sequences to make this possible. The Davis reading test was used because it was suitable for grade nine, it had three fairly equivalent forms, and it contained a reliable measure of reading comprehension speed. It also received good reviews (Coffman, 1968, pp. 291-2). Forms A, B, and C were used because they were the most statistically equivalent forms.

Intelligence Quotient. The Canadian Lorge-Thorndike Intelligence Test, Level F, Verbal Battery was administered to all students involved in the study. A major portion of the Canadian norming was carried out in the Edmonton Separate School System. The Verbal Battery subtests measure word knowledge, sentence completion, verbal classification, and verbal analogies.

Data Collection Procedures

Writing. The students were presented with the topics following a discussion of what argumentative writing entailed. The topics were presented in the form of a unit on argumentative writing. Teachers agreed to mark these compositions as usual, that is, for such things as content, organization, spelling, punctuation, and grammar. All essays were photocopied and returned to the teachers within one day. They agreed to be punctual in their marking, to maintain momentum. Compositions were written at two-week intervals except for occasion 2 which was three weeks after the pretest. All essays were written on

Monday or Tuesday mornings. They were encouraged to reread their essays and rewrite if they so desired. They were also permitted to argue both sides of the topic to alleviate the problem of "what to say". Essays were given to students for their perusal and then re-collected. They were not returned again until after the delayed post-test.

Reading. Administration instructions as outlined in the test manual were strictly adhered to. The three testing occasions were proposed to the students as a method of obtaining a better overall picture of their reading ability.

Scoring Procedures

Writing. The compositions written by the experimental and control groups were "scored" by counting these frequencies for the six testing occasions: total number of words, words per T-unit, words per clause, and clauses per T-unit. In addition, the minor indices were counted for the pretest, post-test, and delayed post-test compositions of thirty randomly selected subjects in each of the experimental and control groups. The reason for adopting Loban's methodology of limiting the subsamples to 30 was the same as his: "the time-consuming nature of the analysis". (Loban, 1967, p. 140) The T-unit segmentation rules followed were those used by O'Hare (1973, p. 48) and Combs (1975, p. 54-6).

Reading. The reading test results were optically scored. The raw scores were converted to scaled scores to standardize them and

alleviate the problem of slight differences in the mean scores among forms, further refining the control achieved by random assignment to test form.

DATA ANALYSIS AND RESULTS

The .05 level of significance was adopted for all analyses.

Intelligence Quotient

The first part of the analysis undertaken was a one-way analysis of variance to determine whether there was a significant difference between the experimental and control groups.

Table 2

Experimental and Control Group Comparison: IQ

Group	Cases	Mean	Standard Deviation	p-value
Experi- mental	75	100.88	11.70	0.935
Control	68	101.70	12.95	

Table 2 shows the very small differences between the two groups on the basis of IQ. The table also establishes the likelihood that the two groups were drawn from the same population.

Writing

Topic comparison. Prior to the experimental-control group comparison, a check was made to determine whether the topics were roughly equivalent. This was done to determine whether the teachers' intuitions about

their equivalency were correct. The six major indices (W, TU, CL, W/TU, W/CL, CL/TU) were used in this one-way analysis of variance procedure. A significant difference among topic means was found on the words per clause index. The only significant difference found by the subsequent Scheffe-Multiple Comparison of means showed the only significant difference to be between topics three and six: "The World Won't Survive Past the Year 2000" and "Everybody Needs Friends." (See Table 3).

Table 3
Comparison of Topics: Pre-Test

Topics	1 (n=23)	2 (n=22)	3 (n=28)	4 (n=24)	5 (n=23)	6 (n=23)	p
Words	221.87	228.63	217.04	203.50	208.83	198.48	0.466
T-units	16.22	18.27	15.43	15.33	15.22	15.65	0.405
Clauses	27.83	27.82	25.86	27.00	26.65	27.87	0.928
Dep.Cl.	11.61	9.55	10.43	11.67	11.44	12.22	0.296
W/TU	14.11	13.25	14.49	13.92	13.95	13.09	0.456
W/Cl	8.11	8.30	8.50	7.79	8.01	7.23	0.020 *
Dep.Cl/TU	0.75	0.60	0.71	0.82	0.77	0.82	0.200

*Significant difference beyond the .05 level

Experimental/Control Comparison: Major Indices. A two-way analysis of variance with repeated measures was carried out to determine if there were any significant differences between the mean scores of the experimental and control groups on the pretest and the five subsequent occasions. The results are displayed graphically in Figures 1 to 6.

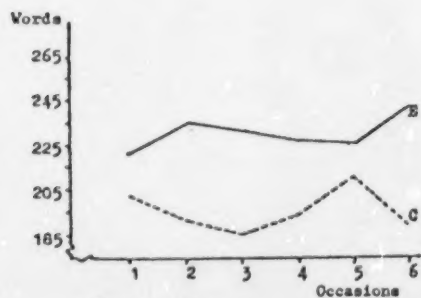


FIGURE 1: Words

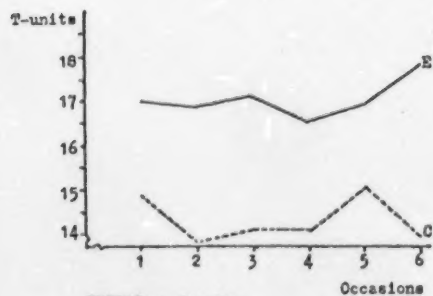


FIGURE 2: T-units

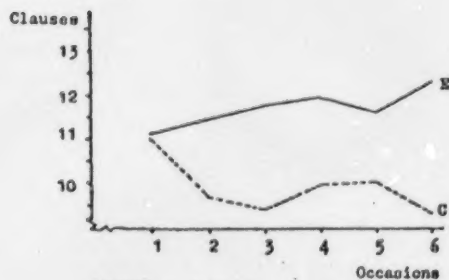


FIGURE 3: Clauses

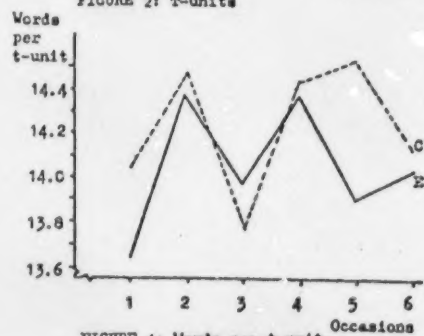


FIGURE 4: Words per t-unit

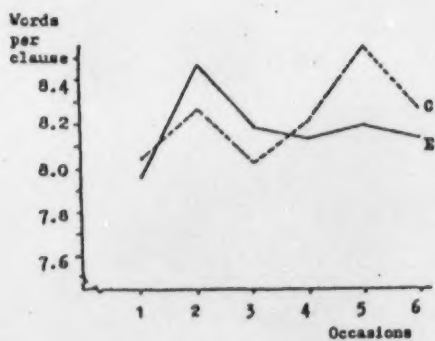


FIGURE 5: Words per clause

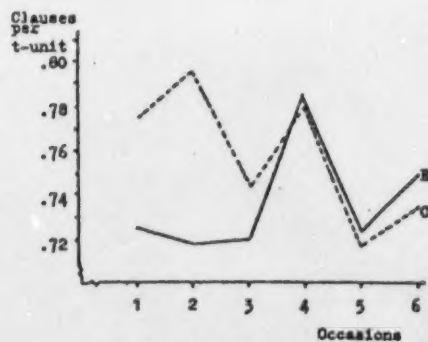


FIGURE 6: Clauses per t-unit

The means are provided in Table 4.

Although the experimental group did increase the number of words per essay that they wrote, the increase was not significant at the .05 level. A second test using the analysis of covariance procedure produced almost identical results. Therefore the null hypothesis was not rejected.

The experimental treatment did not result in a significant increase in the mean number of T-units written by the experimental group. Therefore, the null hypothesis was not rejected.

Despite the increase in the mean number of dependent clauses written by the experimental group, the mean number of such clauses written by each group did not change significantly across the six occasions. The null hypothesis was not rejected.

No significant mean differences in words per T-unit were found between groups or across the six occasions. The null hypothesis was not rejected.

No significant differences were found in the mean number of words per clause across the six occasions of the experiment. The null hypothesis was not rejected.

The mean number of clauses per T-unit did not increase significantly in the writing of either group, nor were any differences significant on any of the six occasions. The null hypothesis was not rejected.

Experimental/control subsample comparison: minor indices. A Chi-square test for goodness-of-fit was used to compare pretest means of each subsample with the remainder of their groups using the major indices. The

Table 4

Means Comparison of Experimental and Control Groups across Six Occasions: Major Indices

Occasions	1		2		3		4		5		6	
Group	EXP	CON	EXP	CON	EXP	CON	EXP	CON	EXP	CON	EXP	CON
Words	221.7		234.5		232.6		227.3		227.5		242.0	
		203.4		192.0		185.5		193.9		211.2		189.0
T-Units	16.97		16.80		17.01		16.49		16.79		17.75	
		14.88		13.74		14.03		14.03		15.01		14.16
Clauses	11.16		11.44		11.75		11.88		11.51		12.25	
		11.12		9.68		9.44		9.87		10.02		9.10
W/TU	13.64		14.38		13.96		14.38		13.89		14.03	
		14.03		14.47		13.76		14.43		14.54		14.13
W/Cl	7.97		8.46		8.19		8.12		8.18		8.12	
		8.04		8.25		8.01		8.17		8.52		8.25
Cl/TU	.724		.717		.720		.784		.722		.748	
		.773		.794		.741		.781		.715		.731

only significant difference found was on the indices: dependent clauses (control group only) and words per clause (control group only). Because the counts were made on a frequency per clause basis, the difference in the number of dependent clauses written by the control subsample and the controls remaining was judged to be non-confounding. The words per clause was significant also despite the random selection of the subsample members. Rather than re-draw the subsample, it was decided to err on the conservative side in the experimental-control subsample comparisons. This resulted from the fact that the control-group subsample's means on the two indices were higher than those of the remainder. It is possible that a re-drawn sample could have produced different results than those reported below.

An examination of the grammatical structures within the clause was undertaken next. Counts were made for each subsample of thirty students on the pretest, post-test, and delayed post-test compositions.

A two-way analysis of variance with repeated measures was used to test differences between the experimental and control subsamples' means across the three occasions. In short, the treatment did not result in significant changes in the grade nine experimental subsample's use of the syntactic structures which Hunt (1965) indicated were most highly correlated with mature writing. This was the result despite the fact that the experimental group practiced using these structures in the course of the treatment.

Reading

The complete groups were used for all reading score analysis.

Level of comprehension.

A two-way analysis of variance with repeated measures was used to test mean differences between reading level means across the three test occasions. Both groups showed significant increases over the course of the experiment (Table 5), as shown by a Newman-Keuls comparison. However, because the treatment means were not significantly different, the null hypothesis was not rejected.

Table 5
Mean Reading Level Across Occasions

Group	n	Pre-test	Post-test	Delayed Post-test
Experimental	75	67.33	69.29	68.49
Control	68	67.29	68.35	69.12

Speed of comprehension. The analysis of variance results comparing treatment means across the three testing occasions showed significance for occasions and for interaction effect. The means are given in Table 6. It is evident from a study of Table 6 that the experimental group showed the larger increase in mean scores. The analysis of variance results are given in Table 7.

Because the interaction was significant a test of simple occasion main effects ('B') was made. This test showed a significant difference between the experimental group means which was significant beyond the .01 level. The test of simple main effects for the control group

Table 6
Mean Reading Speed Across Occasions

Group	n	Pre-test	Post-test	Delayed Post-test
Experimental	75	67.61	69.76	69.11
Control	68	68.75	69.22	69.04

Table 7
Reading Speed: Analysis of Variance Results

Source	SS	df	MS	F	p
Between subjects	16543.000	142			
'A' Main	4.458	1	4.458	0.038	0.8457
Subjects within	16541.000	141	117.312		
Within subjects	2150.000	286			
'B' Main	128.447	2	64.224	9.240	0.0001 *
'AxB' interaction	51.546	2	25.773	3.708	0.0257 *
'B' x subjects within groups	1960.000	282	6.950		

*Significant beyond the .05 level

across the three occasions revealed no significant differences.

(Table 8.) A one-way analysis of variance was carried out to compare the mean occasional scores for the experimental group. The Newman-Keuls comparison which was performed following the analysis showed

the mean differences between occasions one and two, and one and three for this group were significant. (Table 9)

Table 8

Reading Speed: Test of Simple Treatment Effects

Treatment	Observed Value	Critical Value	df	Significance
Experimental	13.06	3.00	2,296	.01
Control	1.30	3.00	2,296	NS

Table 9

Reading Speed: Newman-Keuls Comparison -- Experimental Group

Occasion 1	3	2	df	Critical Value
1	1.49*	2.15*	3,148	1.02
3		.653	2,148	1.27

*Significant beyond the .05 level Multiplier = .3087

The experimental group thus showed significant growth between pre-test and post-test and maintained this significance over the course of the experiment despite a decline during the delay period. The null hypothesis was rejected.

DISCUSSION OF RESULTS

Writing: Experimental vs Control

No significant mean increases were found on the six major writing indices across the six writing occasions as a result of the Sentencecraft program. It should be noted that, despite the lack of significant mean changes, the experimental groups overall performance improved for each of the six indices over the course of the study. The same is not true for the control group (see Figures 1 to 6). The Hawthorne effect may be at work in the experimental-group performance, and in complementary fashion, the control group may have lacked the motivation to continue writing on the same topics although they were not repeated for any individual. This lack of motivation may account in a large part for their pretest to delayed post-test decline on four of the six indices.

Writing: Pretest Means and Comparisons with Previous Studies - - Major Indices

A comparison of the pretest means achieved by the students in the present study and the means for the major indices which other researchers have provided was then undertaken.

The first three indices were seen as representing a measure of fluency in writing in this experiment. The mean counts for the total group (n=143) on the pre-test occasion are provided in Table 10. These means represent a fairly reliable indicator of what grade nine students are syntactically capable in an argumentative composition

written in forty-five minutes. The pre-test means are provided as benchmarks for future researchers. These means were chosen because they are the one occasion least affected by treatment motivation, or other confounding variables.

Table 10

Mean Number of Words, T-units, and Clauses Written: Pre-test

Index	n	$\bar{X}$	SD
Words	143	213.00	56.38
T-units	143	15.98	4.88
Dependent Clauses	143	11.14	4.26

The next three major indices, words per T-unit , words per clause, and clauses per T-unit, are the indices for which counts have been made most often in previous studies. Comparisons of the mean scores attained by students in this study with those in previous studies are informative and should be helpful to future researchers in that they represent a benchmark indicator for argumentative writing by grade nine students. (Table 11)

Table 11
Comparison of Results of Various Studies: W/TU, W/CL, CL/TU

Index	Author	Grade 3	7	8	9	10	11	12	Superior Adults
W/TU	Hunt			11.5				14.4	20.3
	Loban		8.94	10.37	10.05	11.79	10.69	13.27	
	Perron	13.06							
	O'Hare*		15.75						
	Crowhurst					14.26			
	MacNeill				13.83				
W/CL	Hunt			8.1				8.6	11.5
	Loban		6.98	6.91	6.84	7.76	7.37	8.29	
	Perron	7.72							
	O'Hare*		8.55						
	Crowhurst					8.88			
	MacNeill				8.00				
CL/TU	Hunt			.42				.68	.74
	Loban		.28	.50	.47	.52	.45	.60	
	Perron	.72							
	O'Hare*		.84						
	Crowhurst					.73			
	MacNeill				.75				

*Post-test scores

As can be seen from Table 11 the effect of mode on student writing is very significant. The results found by Crowhurst (1977) and the present study confirm Perron's (1976) findings with grade five students. Argumentative writing does seem to provide students with the opportunity to write more syntactically mature sentences than other descriptive studies have shown. For example, the students in the present study surpass the achievement levels found by Loban (1976) on words per T-unit and clauses per T-unit. Their mean on words per clause is close to Loban's grade twelve mean. Crowhurst's group surpassed Loban's on all three indices. The fact that Perron's grade five sample means are close to Loban's grade twelve means on two of the indices and surpass his grade twelve mean on the third suggests that there may in fact be a topping out at this level. Further research using argumentative writing with higher grades should clarify the situation. Nevertheless, results of studies which have ignored the question of mode of discourse in establishing norms are very suspect.

O'Hare's findings of a great increase in words per T-unit is also somewhat misleading. Hunt's mature adults, Loban's grade twelves, Crowhurst's grade tens, and the present study's grade nines never use subordination in more than seventy-five percent of their sentences. O'Hare's results showed a mean use of eighty-four percent. This appears to represent an overuse of a relatively unsophisticated syntactic option.

The results on these indices in the present study also seem to indicate that the Sentencecraft program is perhaps too unsophisticated syntactically to produce significant increases in the relatively high

mean scores of grade nine students on these indices. Another possible explanation is that grade nine students have reached a plateau in these three areas as Loban (1976, p. 60) suggested, and the significant increases which O'Hare and Combs found with grade seven students are no longer so easily attained. More light can be shed on this question by a comparison of the syntactic structure counts of the subsamples with the results of the Loban and Hunt studies. It should be kept in mind that neither the Hunt nor the Loban descriptive studies insisted on the argumentative mode when taking writing samples.

Writing: Pre-test Subsample Means Compared with Previous
Studies--Minor Indices

Due to the lack of consistent significant increases on the minor indices by either subsample across the six occasions, this discussion will concentrate on comparing the pre-test means of the combined subsamples with those of Hunt (1965).

The frequency counts carried out to determine what was happening within the clauses of the experimental and control subsamples' argumentative compositions reached no significant, consistent increases by either group. The conclusion can be drawn that the Sentencecraft program did not induce consistently significant increases in the writing of the experimental group exposed to the treatment. However, some caution is necessary in any further interpretation of the results. Comparisons of the mean frequencies for the minor indices with those of Hunt (1965) show that these grade nine students in the present study are already quite adept in the use of these syntactic structures.

See Tables 12, 13, and 14.

The number of counts that were made in the present study should provide future researchers with a new set of benchmarks when studying the syntactic capabilities of grade nine students. Again pre-test means are reported because they should be least affected by treatment, motivation or other confounding variables. The control and experimental subsamples' scores are combined in this analysis (n=60).

Table 12
Comparison of Hunt (1965) and the Present Study on
Percentage of Short, Medium, and Long T-units

Index	Author	Grade 8	9	12	Adult
%Short	Hunt	39		23	19
	MacNeill		25.0		
%Medium	Hunt	54		61	43
	MacNeill		58.6		
%Long	Hunt	7		16	38
	MacNeill		16.4		

Table 13

Comparison of Results of Hunt (1965), Loban (1976) and the Present
Study: Noun, Adjective, and Adverb Clauses

Index	Author	Grade 7	8	9	10	11	12	Superior Adults
Noun clauses/ T-unit	Hunt		.16				.29	.23
	Loban	.08	.19	.15	.16	.15	.18	
	MacNeill			.22				
Adjective clauses/T-unit	Hunt		.09				.17	.25
	Loban	.05	.11	.13	.16	.18	.20	
	MacNeill			.17				
Adverb clauses/ T-unit	Hunt		.16				.21	.20
	Loban	.15	.21	.19	.18	.12	.22	
	MacNeill			.31				

Reading: Experimental vs Control

The hypothesis that reading "Level of Comprehension" scores as defined by Davis (1962), would not differ significantly for treatment groups was not rejected. The fact that the differences in mean scores of both groups were significant between pre-test and delayed post-test with no significant differences on occasions suggests that the

Table 14
Mean Number of Syntactic Structures Per Clause

Index	Author	Grade 8	9	12
<u>Total nominalized verbals/clause</u>	Hunt	.07		.14
	MacNeill		.24	
-Gerunds	Hunt	.03		.07
	MacNeill		.12	
-Factive Infinitives	Hunt	.04		.07
	MacNeill		.12	
<u>Total selected verb forms/clause</u>	MacNeill		.42	
-Modal auxiliaries	MacNeill		.34	
-Perfect forms	MacNeill		.03	
-Passives	MacNeill		.05	
<u>Prepositional phrases as noun modifiers/clause</u>	Hunt	.10		.15
	MacNeill		.14	
<u>Verb forms as noun modifiers/clause</u>	Hunt	.07		.09
	MacNeill		.10	
-Past participles	MacNeill		.03	
-Present participles	MacNeill		.04	
-Infinitives	MacNeill		.04	
<u>Total genitives/clause</u>	Hunt	.29		.38
	MacNeill		.13	
-Inflected genitives	MacNeill		.08	
-Phrasal genitives	MacNeill		.05	
<u>Adjectives/clause</u>	Hunt	.39		.43
	MacNeill		.47	

experimental treatment was no more effective than the control activities in improving students' level of comprehension. This is, in fact, what was predicted would happen. The mean Level scores, it was thought, would not increase significantly because there were no structures being practiced that grade nine students could not interpret, given an unlimited amount of time. Thus, it was predicted, the mean differences between groups would not attain significance. Perhaps a more difficult or complex set of sentence-combining problems, using more difficult structures, would produce significant Level differences. It is hard to account for the control groups' significant increases over the course of the experiment considering it only lasted seventeen weeks. Practice effect could be cited as a possible uncontrolled factor.

The hypothesis that reading "Speed of Comprehension" scores, as defined by Davis (1962) would not differ significantly for treatment groups was rejected. The experimental group does in fact show a significant mean increase between pre-test and post-test, and between pre-test and delayed post-test. None of the control group changes were significant. This result was predicted because the practice of sentence combining, it was thought, would facilitate speed in comprehending sentences using the syntactic structures practised in the Sentencecraft program despite the fact that students could already understand them, given a non-speeded situation. It appears that students in grade nine can significantly improve their speed of comprehension by undergoing the Sentencecraft program or in all probability any similar program in which the same structures are practiced.

CONCLUSIONS

The results of this study showed that the Sentencecraft program did not result in significant increases in the mean number of selected words, phrases, or clauses that grade nine students wrote in argumentative compositions. A number of possibilities could explain these results: 1) the argumentative mode itself may actually elicit the greatest complexity or maturity of which grade nine students are syntactically capable; 2) the Sentencecraft program may not provide grade nine students with practice in structures that are sophisticated enough to significantly increase the occurrence of such structures in their writing; or 3) grade nine students may well have reached a plateau in their writing development as Loban (1976) has suggested. Whatever the case, the significant increases achieved by the O'Hare (1973) and Combs (1975) grade seven groups were not found in the argumentative writing of the grade nine students in the present study. However, the argumentative mode did appear to provide student writers with the opportunity to display this syntactic tendency. They scored higher than Loban's grade nines on the majority of writing indices and close to his grade eleven and twelve students on many of these indices. The results supported the findings of researchers such as Perron and Crowhurst who pointed out the importance of controlling mode in writing research. The norms for grade nine argumentative writing which the present study established should be viewed as representing optimum syntactic ability for average grade nine students replacing those of Loban (1976).

Further, the results of this study showed that the Sentencecraft program was not effective in eliciting significant growth in "level" of comprehension of grade nine students as measured by the Davis Reading Test. This may, in fact, have been due to the possible pre-test ability of students to decode any of the structures practiced in the program if given sufficient time.

However, from the results of this study it is reasonable to conclude that the "Speed" of comprehension of grade nine students can be significantly improved by having them complete the Sentencecraft program.

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